Isolation of Carbon Enriched Fly Ash Catalysts

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KEYWORDS: fly ash, agglomeration, unburned carbon, and combustion by-products

ABSTRACT

The utilization of coal combustion by-products, such as fly ash, has an important impact on the coal industry. The rising cost of disposal and the environmental concerns associated with fly ash has caused the coal industry to search for alternative uses for these combustion by-products. Fly ash can generally be used as an additive for Portland cement if its carbon content is lower than 6%. However, the overall quality of fly ashes is changing due to the implementation of low- NO_x burners, where fly ashes produced under these conditions have a higher carbon content and will not meet the required specifications for preparation of Portland cement. Accordingly, there is a current demand for methods to separate the unburned carbon and inorganic components of fly ash and for the development of new applications and markets for these components. This paper explores multistage cleaning processes for the separation of unburned carbon from fly ashes.

A promising ultrasonic oil agglomeration process has been developed for the beneficiation of fly ash using a six-foot agglomeration column. Carbon concentrates have been previously isolated in yields greater than 60 % at purities of 65-74 %. For this work, the carbon concentrates were collected by triboelectrostatic, flotation and ultrasonic column agglomeration methods and tested as catalysts for the dehydrohalogenation of aromatic compounds. The dependence of the carbon catalyst reactivities on the method of separation will be discussed.